

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) In a computing device that may be communicatively coupled to a network by a network communication path that includes one or more network protocol stacks associated with and an abstract interface, the abstract interface situated at a relative location within each of the one or more protocol stacks between a transport layer and a data link layer respectively, the abstract interface for solely managing access to a communication filter stack for the one or more network protocol stacks, the communication filter stack including one or more communication filter instances, which may be configured to perform data filtering operations on data packets being transferred via the one or more network protocol stacks when the data packets are accessed at the abstract interface communication path, a method for inserting a communication filter instance into the a communication filter stack without disrupting the operation of associated the one or more network protocol stacks the abstract interface is situated within so as to conserve processor and network resources, the method comprising:

an act of the abstract interface pausing operation of the an operational communication filter stack to transition the operational communication filter stack to a paused communication filter stack without disrupting operation of the one or more network protocol stacks;

an act of the abstract interface transferring at least one data packet between a transport layer and data link driver of a protocol stack the abstract interface is situated within without performing any data filtering operations on the data packet subsequent to transitioning the operational communication filter stack to a paused communication filter stack and while the paused communication filter stack remains paused;

an act of the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack while at least one associated the one or more network protocol stacks continues to be capable of transferring data between corresponding transport and data link layers; and

an act of the abstract interface restarting the paused communication filter stack to transition the paused communication filter stack back into the operational communication

~~of the filter stack without disrupting operation of the one or more network protocol stacks.~~

2. (Currently Amended) The method as recited in claim 1, wherein pausing operation of ~~the an operational communication~~ filter stack comprises the following:

an act of pausing one or more communication filter instances included in the operational communication filter stack.

3. (Currently Amended) The method as recited in claim 2, wherein pausing one or more communication filter instances included in the operational communication filter stack comprises the following:

an act of one or more pause routines receiving data indicating that the one or more communication filter instances should be paused.

4. (Currently Amended) The method as recited in claim 1, wherein pausing operation of ~~the an operational communication~~ filter stack comprises the following:

an act of redirecting a transferred data packet to a dummy routine that returns the data packets back to the abstract interface ~~the communication path~~ without modifying the data included in the data packet.

5. (Currently Amended) The method as recited in claim 1, wherein the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack comprises the following:

an act of inserting a communication filter instance that was configured by using parameters received from the abstract interface.

6. (Currently Amended) The method as recited in claim 1, wherein the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack comprises the following:

an act of a communication filter driver receiving a filter handle that may be used to facilitate transferring data to an abstract interface.

7. (Currently Amended) The method as recited in claim 1, wherein the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack comprises the following:

an act of a communication filter driver allocating resources for the communication filter instance.

8 (Currently Amended) The method as recited in claim 1, wherein the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack comprises the following:

an act of a communication filter driver creating a filter instance context for the communication filter instance.

9. (Currently Amended) The method as recited in claim 8, wherein a communication filter driver creating a filter instance context for the communication filter instance comprises the following:

an act of the communication filter driver sending the filter instance context to the abstract interface.

10. (Currently Amended) The method as recited in claim 1, wherein the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack comprises the following:

an act of a communication filter driver registering data with the abstract interface.

11. (Currently Amended) The method as recited in claim 1, wherein the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack comprises the following:

an act of a communication filter driver registering data in a system registry.

12. (Currently Amended) The method as recited in claim 1, wherein the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack comprises the following:

an act of inserting a communication filter instance that was configured by using parameters received from a system registry.

13. (Currently Amended) The method as recited in claim 1, wherein the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack comprises the following:

an act of inserting the communication filter instance in a predetermined location in the paused filter stack.

14. (Currently Amended) The method as recited in claim 1, wherein the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack comprises the following:

an act of inserting a communication filter instance that is capable of filtering data packets transferred over virtual connections.

15. (Currently Amended) The method as recited in claim 1, wherein the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack comprises the following:

an act of inserting a communication filter instance that includes an entry point to receive data associated with the power management of the computing device.

16. (Currently Amended) The method as recited in claim 1, wherein the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack comprises the following:

an act of inserting a communication filter instance that includes an entry point to receive data associated with plug and play devices.

17. (Currently Amended) The method as recited in claim 1, wherein the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack comprises the following:

an act of inserting a communication filter instance that includes properties that may be modified through a management interface.

Claim 18. (Cancelled)

19. (Currently Amended) The method as recited in claim 1, wherein the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack comprises the following:

an act of a communication filter driver verifying that the communication filter instance was inserted into the paused filter stack.

20. (Currently Amended) The method as recited in claim 19, wherein a communication filter driver verifying that the communication filter instance was inserted into the paused filter stack comprises the following:

an act of the communication filter driver sending an insertion status to the abstract interface.

21. (Currently Amended) The method as recited in claim 1, wherein the abstract interface restarting the paused communication filter stack operation of the filter stack comprises the following:

an act of starting one or more communication filter instances included in the paused communication filter stack.

22. (Currently Amended) The method as recited in claim 21, wherein starting one or more communication filter instances included in the communication filter stack comprises the following:

an act of one or more start routines receiving data indicating that the one or more communication filter instances should are to be started.

23. (Currently Amended) The method as recited in claim 1, further comprising:
an act of notifying associated network protocol stacks that operation of the operational communication filter stack is going to be paused.
24. (Currently Amended) The method as recited in claim 1, further comprising:
an act of notifying associated network protocol stacks that the operational communication filter stack now includes the inserted communication filter instance.
25. (Currently Amended) The method as recited in claim 1, further comprising
an act of notifying associated network protocol stacks that operation of the paused communication filter stack is going to be restarted.

26. (Currently Amended) In a computing device that may be communicatively coupled to a network by a network communication path that includes one or more network protocol stacks associated with and an abstract interface, the abstract interface situated at a relative location within each of the one or more protocol stacks between an transport layer and a data link layer respectively, the abstract interface for solely managing access to a communication filter stack for the one or more network protocol stacks, the communication filter stack including one or more communication filter instances configured to perform data filtering operations on data packets being transferred via the one or more network protocol stacks when the data packets are accessed at the abstract interface, a method for removing a communication filter instance from the a communication filter stack without disrupting the operation of associated the one or more network protocol stacks the abstract interface is situated within so as to conserve processor and network resources, the method comprising:

an act of the abstract interface pausing operation of the an operational communication filter stack to transition the operational communication filter stack to a paused communication filter stack without disrupting operation of the one or more network protocol stacks;

an act of the abstract interface transferring at least one data packet between a transport layer and data link driver of a protocol stack the abstract interface is situated within without performing any data filtering operations on the data packet subsequent to transitioning the operational communication filter stack to a paused communication filter stack and while the paused communication filter stack remains paused;

an act of the abstract interface causing removing the a communication filter instance to be removed from the paused communication filter stack while at least one associated the one or more protocol stacks continues to be capable of transferring data between corresponding transport and data link layers; and

an act of the abstract interface restarting the paused communication filter stack to transition the paused communication filter stack back into the operational communication filter stack without disrupting operation of the one or more network protocol stacks.

27. (Currently Amended) The method as recited in claim 26, wherein the abstract interface pausing operation of the an operational communication filter stack comprises the following:

an act of pausing one or more communication filter instances included in the communication filter stack.

28. (Currently Amended) The method as recited in claim 27, wherein the abstract interface pausing one or more communication filter instances included in the communication filter stack comprises the following:

an act of one or more pause routines receiving data indicating that the one or more communication filter instances should be paused.

29. (Currently Amended) The method as recited in claim 26, wherein the abstract interface pausing operation of a-an operational communication filter stack comprises the following:

an act of redirecting transferred data packets to a dummy routines that returns the data packets back to the abstract interface the communication path without modifying the data included in the data packet.

30. (Currently Amended) The method as recited in claim 26, wherein the abstract interface causing removing the a communication filter instance to be removed from the paused communication filter stack comprises the following:

an act of pausing the communication filter instance.

31. (Currently Amended) The method as recited in claim 26, wherein the abstract interface causing removing the a communication filter instance to be removed from the paused communication filter stack comprises the following:

an act of a communication filter driver releasing resources associated with the communication filter instance.

32. (Currently Amended) The method as recited in claim 26, wherein the abstract interface restarting operation of the paused communication filter stack comprises the following:

an act of starting one or more communication filter instances included in the paused communication filter stack.

33. (Currently Amended) The method as recited in claim 32, wherein starting one or more communication filter instances included in the paused communication filter stack comprises the following:

an act of one or more start routines receiving data indicating that the one or more communication filter instances should are to be started.

34. (Currently Amended) The method as recited in claim 26, further comprising:

an act of notifying associated network protocol stacks that operation of the operational communication filter stack is going to be paused.

35. (Currently Amended) The method as recited in claim 26, further comprising:

an act of notifying associated network protocol stacks that communicaiton filter instance has been removed from the operational filter stack.

36. (Currently Amended) The method as recited in claim 26, further comprising

an act of notifying associated network protocol stacks that operation of the paused communication filter stack is going to be restarted.

37. (Currently Amended) In a computing device that may be communicatively coupled to a network by a network communication path that includes one or more network protocol stacks associated with and an abstract interface, the abstract interface situated at a relative location within each of the one or more protocol stacks between an transport layer and a data link layer respectively, the abstract interface for solely managing access to a communication filter stack for the one or more network protocol stacks, which may perform filtering operations on portions of data packets being transferred via the communication path, configured to perform data filtering operations on data packets being transferred via the one or more network protocol stacks when the data packets are accessed at the abstract interface, a method for reconfiguring inserting a filter instance into the communication filter stack without disrupting the operation of associated the one or more network protocol stacks the abstract interface is situated within so as to conserve processor and network resources, the method comprising:

an act of the abstract interface pausing operation of the an operational communication filter stack to transition the operational communication filter stack to a paused communication filter stack without disrupting operation of the one or more network protocol stacks;

an act of the abstract interface transferring at least one data packet between a transport layer and data link driver of a protocol stack the abstract interface is situated within without performing any data filtering operations on the data packet subsequent to transitioning the operational communication filter stack to a paused communication filter stack and while the paused communication filter stack remains paused;

a step for the abstract interface reconfiguring filtering operations included in the filter stack in a manner that promotes efficient transfer of data along the network communication path such that the one or more protocol stacks continue to be capable of transferring data between corresponding transport and data link layers during reconfiguration.

38. (Withdrawn) In a computing device that may be communicatively coupled to a network by one or more communication paths and that includes one or more protocol stacks associated with an abstract interface that manages one or more filter instances that may perform filtering operations on packets, a method for filtering packets associated with the one or more protocols so as to conserve processor and network resources, the method comprising:

- an act of processing an input packet;
- an act of the input packet bypassing one or more of the filtering operations associated with a filter instance; and
- an act of sending an output packet that may differ from the input packet if a filtering operation was performed.

39. (Withdrawn) The method as recited in claim 38, wherein processing an input packet comprises the following:

- an act of processing an input packet associated with a data link layer.

40. (Withdrawn) The method as recited in claim 38, wherein processing an input packet associated comprises the following:

- an act of processing an input packet associated with a data link layer driver.

41. (Withdrawn) The method as recited in claim 38, wherein processing an input packet comprises the following:

- an act of processing an input packet associated with a transport layer protocol.

42. (Withdrawn) The method as recited in claim 41, wherein processing an input packet associated with a transport layer protocol comprises the following:

- an act of processing an input data packet associated with the Transmission Control Protocol.

43. (Withdrawn) The method as recited in claim 41, wherein processing an input packet associated with a transport layer protocol comprises the following:

- an act of processing an input data packet associated with the Internet Protocol.

44. (Withdrawn) The method as recited in claim 41, wherein processing an input packet associated with a transport layer protocol comprises the following:

an act of processing an input packet from a transport layer driver.

45. (Withdrawn) The method as recited in claim 38, wherein processing an input packet compromises the following:

an act of processing a data packet transferred along a data path from a transport layer to a data link layer.

46. (Withdrawn) The method as recited in claim 38, wherein processing an input packet compromises the following:

an act of processing a data packet transferred along a data path from a data link layer to a transport layer.

47. (Withdrawn) The method as recited in claim 38, wherein processing an input packet compromises the following:

an act of processing a control packet, which includes request information, and is being transferred along a control path.

48. (Withdrawn) The method as recited in claim 38, wherein processing an input packet compromises the following:

an act of processing a control packet, which includes system indication information, and is being transferred along a control path.

49. (Withdrawn) The method as recited in claim 38, wherein the input packet bypassing one or more of the filtering operations associated with a filter instance comprises the following:

an act of a received input packet bypassing one or more internal filtering operations associated with a filter instance included in a filter stack.

50. (Withdrawn) The method as recited in claim 38, wherein the input packet bypassing one or more of the filtering operations associated with a filter instance comprises the following:

an act of a received input packet bypassing one or more internal filtering operations associated with a filter instance based on characteristics associated with the input packet.

51. (Withdrawn) The method as recited in claim 38 wherein, the input packet bypassing one or more of the filtering operations associated with a filter instance comprises the following:

an act of the input packet completely bypassing the filter instance.

52. (Withdrawn) The method as recited in claim 51, wherein the input packet completely bypassing the filter instance comprises the following:

an act of the input packet completely bypassing the filter instance because the filter instance was configured to operate in bypass mode for the communication path along which the input packet is being transferred.

53. (Withdrawn) The method as recited in claim 50, wherein the input packet bypassing one or more filtering operations associated with a filter instance based on characteristics associated with the input packet comprises the following:

an act of bypassing a first set of filtering operations when an input packet is associated with a first protocol and bypassing a second set of filtering operations when an input packet associated with a second protocol.

54. (Withdrawn) The method as recited in claim 53, wherein the first set of filtering operations and the second set of filtering operations are different.

55. (Withdrawn) The method as recited in claim 38, wherein sending an output packet that may differ from the input packet if a filtering operation was performed on the input packet comprises the following:

an act of sending an output packet that may differ from the input packet if a filtering operation modified the input packet.

56. (Withdrawn) In a computing device that may be communicatively coupled to a network by one or more communication paths and that includes one or more protocol stacks associated with an abstract interface that manages a filter stack, a method for filtering packets associated with the one or more protocols so as to conserve processor and network resources, the method comprising:

an act of receiving an input packet associated with a protocol;

a step for transferring an output packet the may have been filtered by some but not all of the filtering operations included in a filter stack so as to increase efficiency of the filtering process.

57. (Withdrawn) In a computing device that may be communicatively coupled to a network by one or more communication paths and that includes one or more protocol stacks associated one or more filter instances that may perform filtering operations on packets, a method for filtering packets associated with the one or more protocols so as to conserve processor and network resources, the method comprising:

- an act of a filter instance receiving an input packet;
- an act of bypassing a first set of filtering operations when the input packet is transferred across a communication path from a data link layer to a transport layer and bypassing a second set of filtering operations when the input packet is transferred across a communication path from a transport layer to a data link layer; and
- an act of sending an output packet that may differ from the input packet if a filtering operation was performed.

58. (Withdrawn) The method as recited in claim 57, wherein the first set of filtering operations and the second set of filtering operations are different.

59. (Withdrawn) The method as recited in claim 57, wherein the communication path is a data path.

60. (Withdrawn) The method as recited in claim 57, wherein the communication path is a control path.

61. (Withdrawn) In a computing device that may be communicatively coupled to a network by one or more communication paths and that includes one or more protocol stacks associated one or more filter instances that may perform filtering operations on packets, a method for filtering packets associated with the one or more protocols so as to conserve processor and network resources, the method comprising:

an act of processing a packet currently being transferred across a communication path;

an act of the packet completely bypassing a first filter instance in the communication path because the first filter instance was configured to operate in bypass mode for the communication path; and

an act of the packet being received by a second filter instance in the communication path that was configured to receive packets being transferred across the communication path.

62. (Withdrawn) The method as recited in claim 61, wherein the packet completely bypassing a first filter instance in the communication path because the first filter instance was configured to operate in bypass mode for the communication path comprises the following:

an act of the packet completely bypassing a first filter instance in the communication path because the first filter instance was configured by an abstract interface to operate in bypass mode for the communication path

63. (Withdrawn) The method as recited in claim 62, further comprising:

an act of the abstract interface configuring the filter instance to resume receiving packets.

64. (Withdrawn) The method as recited in claim 61, an act of the packet completely bypassing a first filter instance in the communication path because the first filter instance was configured to operate in bypass mode for the communication path wherein comprises the following:

an act of an input data packet completely bypassing a first filter instance in a data path because the first filter instance was configured to operate in bypass mode for the data path.

65. (Withdrawn) The method as recited in claim 61, an act of the packet completely bypassing a first filter instance in the communication path because the first filter instance was configured to operate in bypass mode for the communication path wherein comprises the following:

an act of an input control packet completely bypassing a first filter instance in a control path because the first filter instance was configured to operate in bypass mode for the control path.

66. (Currently Amended) A computer program product for use at implementing, in a computing device that may be communicatively coupled to a network by a communication path that includes one or more network protocol stacks associated with and an abstract interface situated at a relative location within each of the one or more protocol stacks between a transport layer and a data link layer respectively, the abstract interface for solely managing access to a communication filter stack for the one or more network protocol stacks, which may perform filtering operations on portions of data packets being transferred via the communication filter stack path, a method for inserting including one or more communication filter instances configured to perform data filtering operations on data packets being transferred via the one or more network protocol stacks when the data packets are accessed at the abstract interface, the computer program product of implementing a method for inserting a communication filer instance into the communication filter stack without disrupting the operation of associated the one or more protocol stacks the abstract interface is situated within so as to conserve processor and network resources, the computer program product comprising:

a physical computer-readable medium carrying having stored thereon computer-executable instructions, that when executed at the computing device cause the computing device to perform the method, including:

an act of the abstract interface pausing operation of the an operational communication filter stack to transition the operational communication filter stack to a paused communication filter stack without disrupting operation of the one or more network protocol stacks;

an act of the abstract interface transferring at least one data packet between a transport layer and data link driver of a protocol stack the abstract interface is situated within without performing any data filtering operations on the data packet subsequent to transitioning the operational communication filter stack to a paused communication filter stack and while the paused communication filter stack remains paused;

an act of the abstract interface causing inserting the a communication filter instance to be inserted into the paused communication filter stack while at least

~~one associated~~ the one or more network protocol stacks continues to be capable of transferring data between corresponding transport and data link layers; and

an act of the abstract interface restarting the paused communication filter stack to transition the paused communication filter stack back into the operational communication of the filter stack without disrupting operation of the one or more network protocol stacks.

67. (Currently Amended) A computer program product for use at implementing, in a computing device that may be communicatively coupled to a network by a network communication path that includes one or more network protocol stacks and associated with an abstract interface, the abstract interface situated at a relative location within each of the one or more protocol stacks between a transport layer and a data link layer respectively, the abstract interface for solely managing access to a communication a filter stack for the one or more network protocol stacks, the communication filter stack including one or more communication filter instances, which may configured to perform data filtering operations on portions of data packets being transferred via the one or more network protocol stacks when the data packets are accessed at the abstract interface communication path, the computer program product for implementing a method for inserting removing a communication filter instance into from the a communication filter stack without disrupting the operation of associated the one or more network protocol stacks the abstract interface is situated within so as to conserve processor and network resources, the computer program product comprising:

a physical computer-readable medium carrying computer-executable instructions, that when executed at the computing device cause the computing device to perform the method, including:

an act of the abstract interface pausing operation of the an operational communication filter stack to transition the operational communication filter stack to a paused communication filter stack without disrupting operation of the one or more network protocol stacks;

an act of the abstract interface transferring at least one data packet between a transport layer and data link driver of a protocol stack the abstract interface is situated within without performing any data filtering operations on the data packet subsequent to transitioning the operational communication filter stack to a paused communication filter stack and while the paused communication filter stack remains paused;

an act of the abstract interface causing removing the a communication filter instance to be removed from the paused communication filter stack while at

~~least one associated-~~ the one or more protocol stacks continues to be capable of transferring data between corresponding transport and data link layers; and
an act of the abstract interface restarting the paused communication filter stack to transition the paused communication filter stack back into the operational communication of the filter stack without disrupting operation of the one or more network protocol stacks.

68. (Withdrawn) A computer program product for implementing, in a computing device that may be communicatively coupled to a network by one or more communication paths and that includes one or more protocol stacks associated with an abstract interface that manages a filter stack, the filter stack including one or more filter instances that may perform filtering operations on portions of packets, a method for filtering packets associated with the one or more protocols so as to conserve processor and network resources, the computer program product comprising:

a computer-readable medium carrying computer-executable instructions, that when executing at the computing device cause the computing device to perform the method, including:

- an act of processing an input packet;
- an act of the input packet bypassing one or more of the filtering operations associated with a filter instance; and
- an act of sending an output packet that may differ from the input packet if a filtering operation was performed on the input packet.